



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,746	10/01/2004	Jerome K. Hastings	ETC7455.066	5745

27060 7590 12/06/2006

ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (EATON)  
136 S WISCONSIN ST  
PORT WASHINGTON, WI 53074

EXAMINER

NGUYEN, VINH P

ART UNIT PAPER NUMBER

2829

DATE MAILED: 12/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/711,746	Applicant(s) HASTINGS ET AL.	
	Examiner VINH P. NGUYEN	Art Unit 2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2006.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13, 17, 18, 20-35, 38 and 39 is/are pending in the application.
- 4a) Of the above claim(s) 5-9, 13, 17, 18, 20, 32-35, 38 and 39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 10, 21-23, 28-31 is/are rejected.
- 7) ☒ Claim(s) 11, 12 and 24-27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

1. In response to Applicants' remarks filed on 06/28/06 and 10/11/06, Examiner reconsiders to rejoin the species of figures 5 and 7 since they are considered as the same species. It appears that claims 1-4,10-13,21-31 read on the species of figures 5-7 and they are examined.

Furthermore, it appears that the apparatus of figure 4 is a different from the apparatus of figures 5 and 7. The apparatus of figure 4 does not have a pair of PC board fingers configured to receive the first Hall effect sensor and the second Hall effect sensor. The first and second Hall effect sensors (56,58) of figure 4 are not disposed in the fingers (114,116) of the PC board (112) as shown in figure 5. Claims 5,-8,17-18,20 and 32-35 have the features disclosed in figure 4, therefore, claims 5-8,17-18,20,32-35 and their dependent claims 9,13, 38-39 are withdrawn from consideration.

2. Claims 11-12 are objected to because of the following informalities:

In claims 11-12, "the plurality of windings" has not been recited previously, therefore this term is indefinite.

Appropriate correction is required.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4,10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wan et (Pat # 6,984,978)

As to claims 1-2,10, Wan et al disclose a current measurement apparatus as shown in Figure 3 having a conductive path (48) disposed proximate to a printed circuit board (PWB), first and second Hall effect sensors ((10) can to be mounted to the PC board (see column 6, lines 16-39) and adjacent the conductive path to provide feedback indicating a current flow through the conductive path, a processing component (58,62,66,70,74,76) configured to receive the feedback from the first and second hall effect sensors. It appears that the conductive path includes at least a conductor (48). It appears that the processing component is also used to calculate an anti-differential output form the feedback that substantially remove feedback in response to magnetic flux induced externally from the conductive path. Wan et al do not disclose a printed circuit board includes a first and second arms for mounting the first and second Hall effect sensors. However, in figure 4, Wan et al teach that a housing (80) having first and second arms (84,86) for receiving the first and second Hall effect sensors (10). It would have been obvious for one of ordinary skill in the art to provide first and second two arms as taught in figure 4 to the device of figure 3 so that the first and second hall effect sensors are secured properly on the board in order to perform the current measurement accurately.

As to claim 3, Wan et al show a communication interface (76) configured to communicate the anti-differential output for current monitoring.

As to claim 4, the processing component (58,62,66,70,74,76) includes at least one of a summing/differential amplifier (66).

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 21-23,29,31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wan et (Pat # 6,984,978)

As to claims 21 and 31, Wan et al disclose a current measurement apparatus as shown in figure 3 having a conductive path (48), disposed proximate to a printed circuit board (PCB), a first and second Hall effect sensors (10) configured to be mounted to the printed circuit board (see 6, lines 16-39) and adjacent the conductive path to provide feedback indicating a current flow through the conductive path, a processing component (58,62,66,70,74,76) configured to receive the feedback from the first and second hall effect sensors. It appears that the conductive path includes at least a conductor (48). It appears that the processing component is also used to calculate an anti-differential output from the feedback that substantially remove feedback in response to magnetic flux induced externally from the conductive path. Wan et al does not disclose the conductive path includes at least one spiraled portion configured to encircle at least a

portion of the PC board. However, Duhashi et al teach that it would have been well known to have a conductor (30) with different shape portion encircle at least a portion (an opening "70") of the circuit board (72). It would have an obvious design choice for one of ordinary skill in the art to have the conductor path (48) of Wan et al with a different shape portion as taught by Duhashi et al since the criticality of this feature has not been established by Applicants. Furthermore, the shape of the conductor is not given patentable weight. (See *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)).

As to claim 22, Wan et al disclose a current measurement apparatus as shown in figure 3. Wan et al do not disclose a printed circuit board includes a first and second arms for mounting the first and second Hall effect sensors. However, in figure 4, Wan et al teach that a housing having first and second arms (84,86) for receiving the first and second Hall effect sensors (10). It would have been obvious for one of ordinary skill in the art to provide first and second two arms as taught in figure 4 to the device of figure 3 so that the first and second hall effect sensors are secured properly on the board in order to perform the current measurement accurately

As to claim 23, it appears that the first and second arms would include air gaps for receiving the first and second sensors.

As to claim 28, Wan et al teach that a housing (80) having first and second arms (84,86) for receiving the first and second Hall effect sensors (10). It would have been obvious for one of ordinary skill in the art to provide a housing configured to received and arrange the PC board,

the first and second hall effect sensors and at least a portion of the conductive path.

As to claim 29, it appears that Wan et al show a communication interface (76) configured to output a current signal indicative of current flow through the conductive path.

As to claim 30, it appears that the conductive path (48) inherently comprises an input terminal configured to supply current flow to the conductive path and an output terminal configured to release current flow from the conductive path.

7. Claims 24-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art does not disclose at least one spiraled portion includes a first spiraled portion encircling the first arm and a second spiraled portion encircling the second arm as recited claim 24. Since claims 25-27 depend from objected claim 24, these claims are also objected accordingly.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to VINH P. NGUYEN whose telephone number is 571-272-1964.


The examiner can normally be reached on 6:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

Art Unit: 2829

supervisor, HA T. NGUYEN can be reached on 571-272-1678. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
VINH P NGUYEN  
Primary Examiner  
Art Unit 2829

11/30/06